PHOTOP

UV LED Exposure Machine C Series
C1000
Manual

Thank you very much for buying UV LED Exposure Machine.

★Please read this manual carefully before using this machine, and please use it correctly.

★Please preserve this manual carefully for the future consulting.

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Safe notes for LED products

About the class division of LED products

The light source of this machine uses Class 3B LEDs (according to GB7247.1-2001). Because there are tens of LEDs, this machine is a Class 4 LED system.

Max output light power：310mW	Wavelength：365±5nm
Class 4 LED System	GB7247.1-2001

If the set up and the control don't follow the steps regulated in this manual, there will be a risk to be irradiated by UV lights.

- In order to protect the operator from the UV light, opening the cover when this machine is working is forbidden.
  When the cover is open, this machine is build to stop working immediately. However, there are still possibilities that the security structure expires because of the aging or some other reasons. Thus, opening the cover when working and manual pushing down or de-structing the security structure are forbidden.
- In order to protect the operator from the UV light, please install and set up this machine correctly.
  Otherwise, there are possibilities that the UV light hurts the operator's skin.
- Please turn off the power and unplug the cable before cleaning the exposure window.
  Otherwise, there are possibilities that the UV light hurts the operator's skin and eyes.
- Disassembling this machine is forbidden.
  Otherwise, there are possibilities that the UV light hurts the operator's skin and eyes.
- In order to prevent other people from coming close, barrier or other isolating fixtures are recommended to install.
- Please wear glasses that can isolate the UV light when operating this machine.
- Operating this machine not following the method regulated in this manual is forbidden.
  Otherwise, there are possibilities that the UV light hurts the operator's skin and eyes.

Security policy for the operator

In the "user manual" of GB7247.1-2001, the preventive measures and management standard that the operator should follow are regulated.

Please use the security policy for Class 4 LED products when operating this machine.

Moreover, please consulting the GB7247.1-2001 for the detailed situation.

Safe sign

Before the shipment of this machine, the Chinese/English safe sign (regulated by GB7247.1-2001) has already plastered on its cover. Please protect the safe sign when installation and operation. We won't be responsible for any breakdown or damage caused by the safe sign's damage.

Chinese/English safe sign (GB 7247.1-2001)

Safe notes

The points for attention in this manual are used to regulate the safe and correct operations and prevent the humans and machine. In order to show the damages and urgency clearly, the mistaken operations are classified as "**warning**" and "**attention**".

The following contents are very important safe notes. Please make sure of obeying them.

Warning contents that may cause human's death or severe wound.

Attention contents that may cause human's wound or property's damage.

Warning	
Forbid	★ Opening the cover when this machine is working is forbidden, and manually push down or destructing the protection structure are forbidden too. Otherwise, it may cause severe damage to human's eyes and skin. Class 4 LED system.
Must obey	★ The operator must wear glasses and other protection apparatuses when operating this machine. Otherwise, it may cause severe damage to human's eyes and skin. The wavelength of the UV light emitted from this machine is 365nm, please use protection apparatuses that can block 365nm UV light.
Forbid to disassemble	★ Never disassemble, repair or reconstruct this machine using any methods that aren't regulated in this manual. Otherwise, it may cause accidents or human's wound.

Attention	
Must obey	★ Please make sure of turn off the power and unplugging the cable after finishing the operation. Otherwise, it may cause an electric shock or an electric leakage and fire because of insulation breaking down etc.
	★ Please unplug the cable with hand holding the plug. Otherwise, it may cause an electric shock or a short circuit fire.
	★ Don't use any power supply besides the regulation. Otherwise, it may cause a fire.
Forbid	★ Please don't use this machine if the cable or plug is broken, or the socket is loose. Otherwise, it may cause an electric shock or a short circuit fire.
	★ Don't use this machine in some place with rapid temperature change or easy to condensing. Otherwise, it may cause the machine breakdown.
	★ Don't use this machine in some place with violent vibration or impact. Otherwise, it may cause the machine breakdown.
	★ Don't operate this machine on the hands. (non hand-hold machine) Otherwise, it may cause an electric shock.

Usage notes

1. Please don't use any power supply with incorrect voltage and frequency. Otherwise, it may cause damages to the machine. The attached cable is a 220V cable that can be in Mainland China. When this machine is used in other countries or regions, please use authenticated cables that can fit the appearance and the use.
2. Please use this machine in the conditions listed below. Otherwise, it may shorten the life of the machine.
    - Ambient temperature: 0℃~35℃.
    - Relative humidity: lower than 85%.
    - Environment: with less dust, soot and polluted air; without rapid temperature change; without violent vibration and impact.
    - Storage temperature: -10℃~60℃, relative humidity less than 85% (without condensation).
3. Please don't put anything on this machine or obstruct the vents of this machine. Otherwise, it may cause the machine damaged because of the high temperature.
4. If there are some stains on the exposure window, it may decrease the UV light power and reduce the solidification capability. Please clean the exposure window using alcohol.
5. Please don't drop this machine or exert a violent impact to it.
6. When installing this machine, please use rubber cushions, adjust to the horizon and operate it correctly. If operating this machine while it's tilting or inverted, it may be breakdown and damaged. It's very dangerous and please don't do that!
7. If there is an interference superposing on the power supply, it may cause this machine breakdown or misoperating.
8. Please don't sharing the same power with electric machinery, inductance machinery or high power equipment.
9. Please don't exert a curving pressure on the cable near the plugs and don't exert a tensile force between the cable and the plug. Otherwise, it may cause the cable break.
10. Before this machine leaves the plant, Chinese/English safe signs have been stuck to its cover. Please take care of those safe signs. Otherwise, it may cause the operator's misoperation.

Services and Commitments

Commitments:

- In one year after the delivery, we can provide free repair if this machine breaks down while working normally. If the breakdown is caused by the user or the consumables or the natural disasters, we won't provide free repair.
- The warranty period is one year after the delivery.

production compensation:

- We don't compensate any loss of production stagnation or non-confirming products caused by the breakdown of this machine.

Characteristic of C1000

C1000 is a machine used to UV irradiate the tape below the wafer after the wafer scribing. UV light can lower the stickiness of the tape so that the wafer can be picked up easily.

★ It's suitable for wafers in different sizes.

It's suitable for 2", 4" and 6" wafers, and the exposure range can be adjusted according to the wafer size.

★ Over 10,000 hours lifetime of the light source.

The lifetime of the light source is several times longer than the that of the tube in traditional machines. It can lower the run cost.

★ The volume of this machine is much smaller than that of the traditional machine, and it can reduce the field occupancy.

★ There is no need to preheat.

Because the preheat is no longer necessary, this machine can be turned of during the intervals. This can save energy and reduce the effect to the lifetime of the LEDs.

★ Nitrogen pressure protection.

Only if the Nitrogen pressure in the exposure chamber reaches a threshold, the machine will start to irradiate UV light.

★ No heat radiation in the irradiation process.

The light source is an array of UV LEDs, there is no IR heat radiation.

★ Simple and easy to operate.

Simple and brief operation interface make the operation easier.

★ UV LEDs short circuit and open circuit protection.

When there is a short circuit or open circuit, this machine will not start to irradiate.

★ Open-cover protection.

While this machine is working, it will stop irradiating automatically if the cover is open incorrectly.

★ UV light leakage protection.

There is a light leakage protection structure in the cover. It can block the UV lights while this machine is working.

Constitution of this product

Please ensure the things in the package.

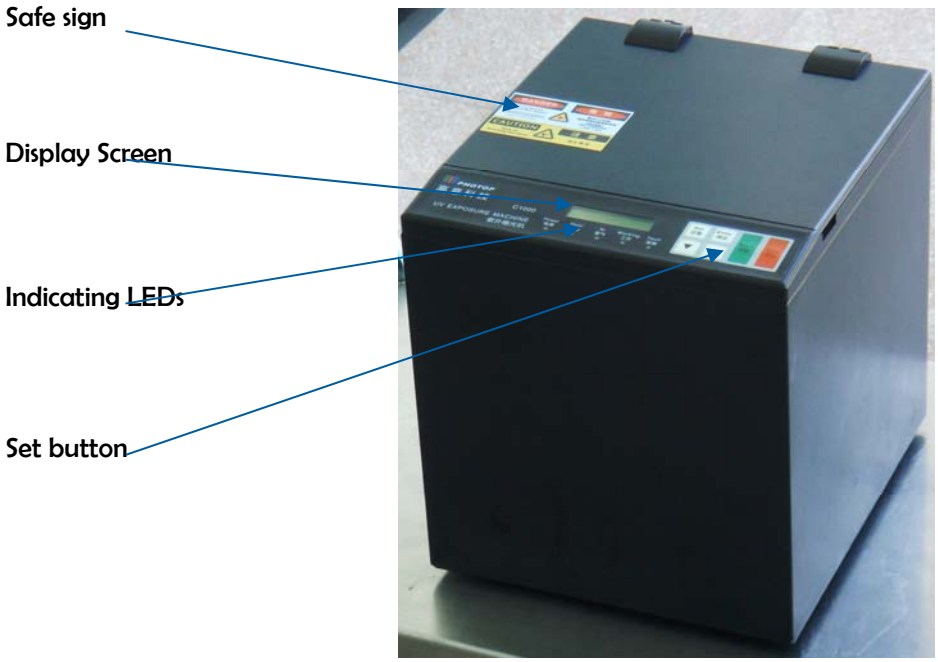
★ One Exposure machine.

★ One cable.

★ One manual.

Names and functions of the main parts

Frontage of the machine

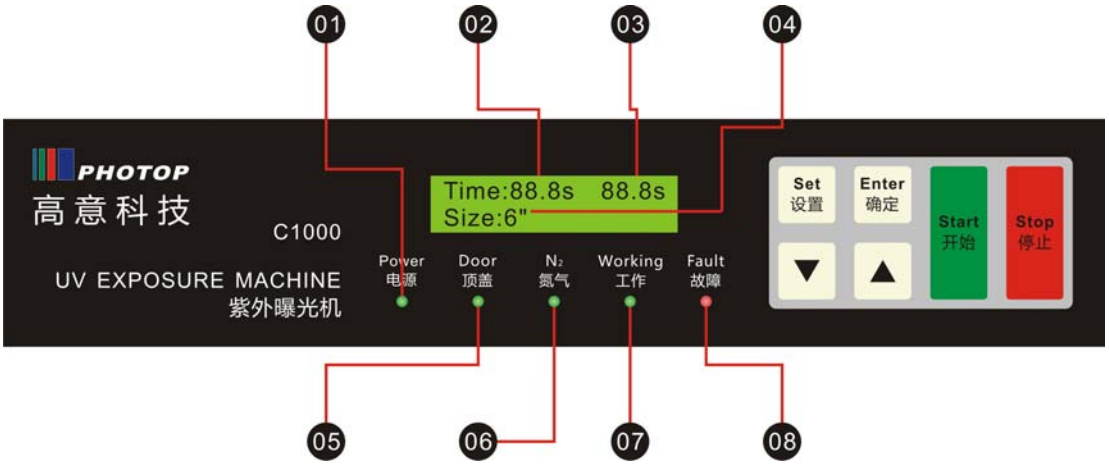


Back of the machine

Names and functions of the main parts

Illustration of the display screen and the indicating LEDs

No.	Name	Display	Illustration
1	Power LED	Green	After the machine is connected to the power supply, and the power switch is turned on, this LED will lighten.
2	Exposure time	Number	The exposure time that the operator sets is shown here.
3	Working time	Number	It shows how long this exposure has passed.
4	Wafer size	Number	It shows the exposure range.
5	Door LED	Green	This LED will lighten when the cover is closed correctly.
6	N_2 LED	Green	This LED will lighten when the N_2 is being input to the exposure chamber.
7	Working LED	Green	This LED will lighten when the UV LEDs is irradiating.
8	Fault LED	Red	This LED will lighten when the N_2 pressure is abnormal, or the cover is open while working, or there is a short circuit or open circuit.



Operating illustration

1. Power on/off

- Plug in the machine, then connect the Nitrogen hose (1~2kg/cm^{2}G) to the "N_2 Input" connector at the back of the machine.
- Move the red button "Power Switch" at the up-left corner of the machine to the "|" position, then the machine is power on.
- When the machine is power on, the green "Power" LED lamp at the frontage will lighten. This means the machine is on and it can be set and work.
- Move the red button "Power Switch" at the up-left corner of the machine to the "○" position, then the machine is power off. After the machine is power off, please unplug it.

2. Time and size setting

- When the machine is on, press the "Set" button, then the tens digit of the time shown in the display screen will start twinkling, like "Time:88.8s" (the digit in blue shows the twinkling digit). The twinkling digit is the adjustable digit.
- By pressing the "▲" button once, the twinkling digit will add 1. By pressing the "▼" button once, the twinkling digit will subtract 1.
- There is one thing needed to be noticed that the digit adjusting may affect other digits. If the initial status is "01.0s", it will change to "00.0s" after pressing the "▼" button once, and it will change to "99.0s" after pressing the "▼" button once again. If the initial status is "01.0s", it will change to "00.9s" after pressing the "▼" button once, and it will change to "01.0s" after pressing the "▲" button once again.
- After the first press on the "Set" button, the first adjustable digit is the tens digit of the time, like "TIME:88.8s". If press the "Set" button again, the twinkling digit will change to the units digit, like "TIME:88.8s". The effect of pressing the "Set" button is: tens digit of time -> units digit of time -> tenths digit of time->size ->exit.
- When setting the wafer size, the displayed size can change among "2" , "4" and "6" by pressing "▲" or "▼" button.
- Whatever is being set, it will exit the setting mode if pressing the "Enter" button.
- When the machine is shut down, the current time setting will be saved automatically, and it will be the default setting of the next time. However, the wafer size setting can't be saved and the default setting is always "6" .
- The adjustable range of the exposure time is 0.1-99.9s.

3. Irradiation and Stop

- Close the cover and ensure the "Door" lamp is lightened. If the "Door" lamp is not lightened, it means the cover is not closed correctly and the exposure cannot be started.
- After pressing the "Start" button, the machine will start to inflate and the "N_2" lamp will lighten. This means the exposure chamber is inflated with nitrogen. This process takes 3 seconds.
- After inflation, the "Working" lamp will lighten, which means the UV LEDs have lightened and the exposure has begun. Meanwhile, The actual working time displayed on the screen begins to time.
- When the exposure time is up, the "Working" and "N_2" lamps will black out, and the actual working time will be cleared.

4. Breakdown warning

After pressing the "Starting" button, the machine won't start exposure and the "Fault" lamp will lighten if there are some abnormal situations. While the machine is working and some abnormal situations take place, the "Fault" lamp will lighten and the exposure will stop automatically. There are three possible abnormal situations:

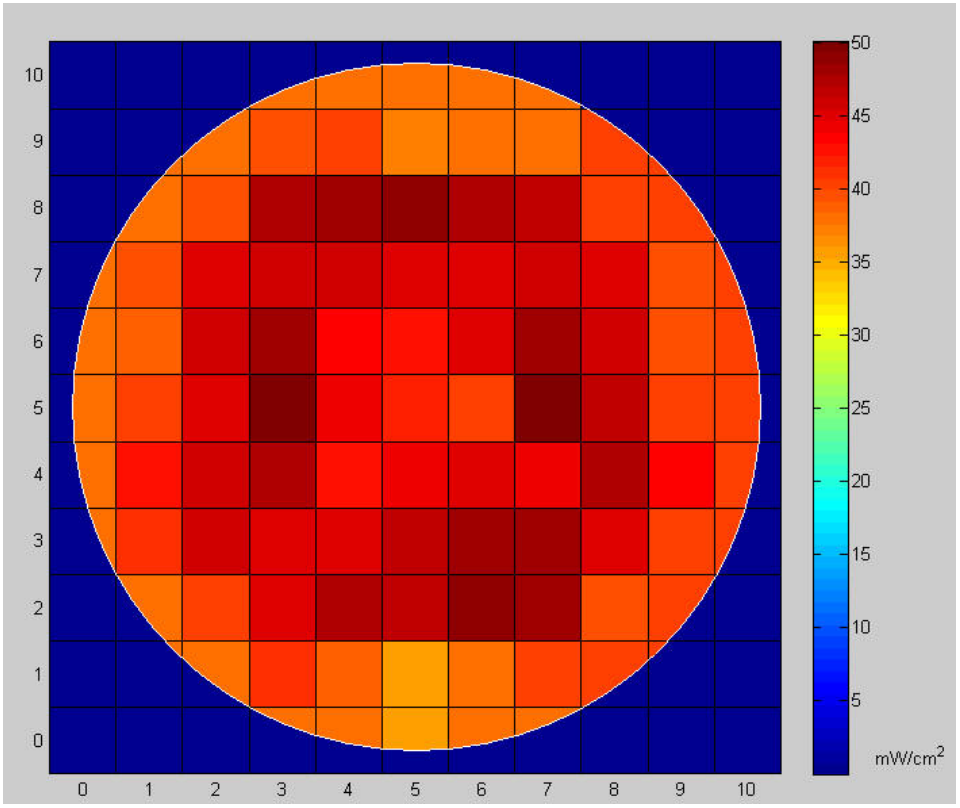
- The nitrogen pressure in the exposure chamber is abnormal.
- The cover is not closed correctly before starting, or it's open suddenly while working.
- There are some short circuits or open circuits.

Specs

Parameter		Unit	
Wavelength		nm	365±5
Nitrogen Input Pressure		Mpa	0.15-0.2
Nitrogen Input Caliber		mm	Φ6
Nitrogen Charge Time	Typ.	s	3
Exposure Time		s	0.1-99.9
Light Power Density	Typ.	mW/cm^2	43.8
Wafer Size		inch	2, 4, 6
Size		mm	300×330×370(W×D×H)

Standard of UV light power and uniformity

Average UV light power density in the exposure window is about 43.8mW/cm^2.
UV light uniformity in the exposure window is shown below:



Revision history

Version	Release time	Revision
1.0	2008.07	Initial release